ENVIRONMENTAL ASSESSMENT
FOR THE
BAR HARBOR WATER COMPANY

PROPOSED WATER STORAGE TANK
BAR HARBOR, MAINE

JANUARY 2000

Lead Agency:

Bar Harbor Water Company
337 Main Street
Bar Harbor, ME 04609

Cooperating Agency:

National Park Service
Acadia National Park
P. O. Box 177
Bar Harbor, ME 04609

Table of Contents

TABLES

FIGURES

APPENDICES

SUMMARY

The Bar Harbor Water Company is proposing to construct a new water storage tank in Bar Harbor, Maine on land owned by the United States of America and administered as Acadia National Park. The purpose of the new tank is to provide additional storage capacity for treated drinking water within the municipal water system for the Town of Bar Harbor. The additional storage capacity is needed to bring the system into compliance with the Federal Surface Water Treatment Rule and the Maine Drinking Water Program requirements.

This Environmental Assessment provides documentation of the project development process, descriptions of six alternative actions that were considered, and an analysis of the potential impacts on the environment of the reasonable alternatives. The environmental issues associated with the proposed project focus on its potential to affect: Soils and Geology; Wetlands and Water Resources; Vegetation and Natural Communities; Rare Plant and Animal Species; Wildlife; and Cultural, Recreational, and Visual Resources. These environmental issues are of particular concern, given that the proposed project site is located within a nationally significant park.

Alternative A is the No-Action alternative. In this case, "no action" means the project would not take place and the mandate by Federal and State of Maine regulations for the Bar Harbor Water Company to remedy the deficiency in its current drinking water system would not be met. Alternative A is included as the baseline for the analysis of other alternatives.

Alternative B, the preferred alternative, involves constructing a new, below-ground water storage tank on Great Hill near the existing summer pump station and storage tank. The proposed site is situated just off the eastern side of Duck Brook Road, near the Duck Brook carriage road bridge. Vegetation of the site is dominated by a pole-sized, hardwood forest stand with sparse understory conditions. The forest floor is made up of shallow, mineral soils with frequent stones and bedrock outcrops. No wetlands, streams, rare species, or known archeological or historic resources are present on the site, but may be located nearby.

Constructing the tank would involve clearing approximately one acre and building a 50-foot by 140-foot tank and access road into the gently-sloping hillside. Effects of Alternative B on Soils and Geology, Wetlands and Water Resources, Vegetation and Natural Communities, Rare Plant and Animal Species, or Wildlife resources would be minimal. Visual concerns are a key element of the assessment due to the historical and recreational nature of the nearby Carriage Road System in Acadia National Park. Alternative B is expected to have only a slight effect on visual resources. These effects would be minimized during peak recreational use periods by summer foliage. A visual analysis indicates that the clearing would result in an opening in the upper portion of the forest canopy at the site. The tank itself would not be visible (even during leaf-off conditions) from the Duck Brook Bridge or from local carriage road vista points. Any visual effects caused by opening the leaf canopy can be further mitigated through supplemental plantings and/or by creating irregularly cleared edges.

Four other Alternatives, C through F, were considered in the alternatives analysis, but have been eliminated from further study. On the basis of engineering, financial, visual, and environmental impact concerns, none of these alternatives are considered reasonable. Alternatives C and D would be highly visible from the Park Loop Road. Alternative E would have excessively high energy and operational costs, and would potentially result in extensive environmental impacts if existing piping was upgraded for winter use or if chlorinated water were periodically discharged to Duck Brook (as would be required to prevent freezing in the transmission system). Alternative F would incur high financial costs and cause major disruptions to in-town streets during construction, and would not resolve the current deficiency in treated water storage.

1.0 INTRODUCTION

1.1 PURPOSE AND NEED

The Bar Harbor Water Company (Water Company) proposes to construct a 500,000 gallon treated water storage tank and access road in Bar Harbor, Maine on land owned by the United States of America and administered as Acadia National Park. Presently, the municipal water system in Bar Harbor lacks sufficient treated water storage to supply the water needs of the community. The current system relies primarily on storage provided by Eagle Lake, an untreated water source located within Acadia National Park. The proposed treated water storage tank will allow the Bar Harbor Water Company to automatically isolate Eagle Lake from the distribution system, thereby preventing the occurrence of a treatment violation if the disinfection system fails, while still supplying the water demand in the community.

To comply with the regulatory requirements of the Maine Drinking Water Program, the Water Company installed an automatic source isolation system last year. The isolation system will prevent untreated water from Eagle Lake from reaching the consumers if the treatment system fails. The isolation system must be in operation by the end of this year, which in turn requires that the proposed storage tank be completed and in service by the end of this year.

If the treatment system were to fail and isolation of the water source were to occur without sufficient treated water storage in place, portions of the community would immediately lose pressure and water. Negative pressure (vacuum) would be developed in portions of the system, which could draw bacteria into the piping system and result in a violation, thereby requiring the construction and operation of a water filter plant. If the Water Company were to fail to comply with the regulatory mandate to operate the isolation system, fines would be imposed by the regulatory agency. If the treatment system were to fail without the isolation system in service, a violation would occur and a mandate to filter would be imposed.

Preventing treatment violations is a significant concern to protect the public health, and to prevent a regulatory mandate to filter the water. The Water Company had a treatment violation in August of 1999, and if another violation occurs prior to August of 2000, the Maine Drinking Water Program will require the Water Company to construct and operate a water filter plant within twelve months from the date of the second violation. The construction of a filter plant could have significant economic and environmental impacts, and the proposed treated water storage tank would still be needed to satisfy regulatory requirements.

1.2 THE DECISION

The National Environmental Policy Act requires the Water Company and the NPS to provide the opportunity for public comment on federal actions affecting the environment. This Environmental Assessment identifies the objectives of the project, the decisions to be made, alternative actions, and the effects of each alternative on the natural and human environment.

The Water Company is the Lead Agency that has prepared this Environmental Assessment, and will decide how the project will be implemented. The National Park Service (NPS) is a Cooperating Agency, has assisted with the preparation of this Environmental Assessment, and will decide issues related to use of the land that is needed for the project. The Water Company will coordinate with the NPS to minimize effects caused by the proposed project.

Public comment on this Environmental Assessment will help the Water Company and the NPS consider the alternatives set forth and to decide whether to allow the Water Company to use Acadia National Park lands to construct a facility that would bring its municipal water system into compliance with the federal Surface Water Treatment Rule and the Maine Drinking Water Program.

Interested persons are invited to review this document and submit written comments by February 29, 2000 to:

Superintendent
Bar Harbor Water Company
337 Main Street
Bar Harbor, ME 04609

2.0 BACKGROUND INFORMATION

2.1 WHY ADDITIONAL TREATED WATER STORAGE IS NEEDED

In 1989, the United States Environmental Protection Agency issued the Surface Water Treatment Rule (SWTR), which mandates various drinking water treatment requirements to remove or inactivate microorganisms and viruses in surface water supplies. To meet the SWTR requirements, the Water Company draws its water from Eagle Lake, applies chlorine gas at the intake structure located on the shore of Eagle Lake, and relies on sufficient contact time in its transmission system to inactivate microorganisms and viruses. Approximately 1.2 miles downstream of Eagle Lake, the Water Company monitors the chlorine residual to ensure that the SWTR treatment requirements have been met, and supplies water by gravity to the distribution system to meet the fluctuating water demand of the community. The Water Company must ensure that the chlorine residual at the pump station is sufficient to achieve the required treatment at all times, and is mandated to report the achieved level of treatment during the peak hourly flow each day.

The Maine Drinking Water Program identified two weaknesses during its 1998 annual inspection of the Bar Harbor water system, and required that corrective actions be taken immediately:

1) Eagle Lake must be isolated from the distribution system in the event that adequate treatment levels are not obtained; and,

2) The system must contain adequate treated water storage to ensure that treated water would be available to the community if the treatment system fails and untreated water from Eagle Lake has to be isolated from the rest of the system.

During 1999, the Water Company installed instruments and controls that will automatically isolate Eagle Lake from the distribution system if adequate treatment is not obtained. However, before the isolation system can be placed in service on a year-round basis, additional storage for treated water must be provided downstream of the isolation system. The new storage tank would be designed to supplement the existing storage facilities, and to provide storage for approximately one average day volume of treated water, which may be drawn upon in the event that the untreated water supply must be isolated from the distribution system.

The Maine Drinking Water Program recognizes that the Bar Harbor system needs additional treated water storage before the isolation system can be used during gravity flow operation. The Maine Drinking Water Program is allowing the Water Company to bypass the isolation valve only during this winter's period of gravity flow operation until additional treated water storage is available next year. In the highly unlikely event that inadequately disinfected water enters the distribution system, a public notice to boil water before ingesting it (Boil Order) will be issued, so that the public health and safety are protected at all times.

2.2 DESCRIPTION OF EXISTING WATER SYSTEM

Since 1874 when the Water Company was incorporated, municipal water for the Town of Bar Harbor (Town) has been supplied by gravity from an intake located on the north end of Eagle Lake. At one time, the Water Company owned property surrounding Eagle Lake and held property or rights-of-way on lands on which their improvements lie. After the establishment of Acadia National Park, the land held by the Water Company was donated to the United States of America to be part of the park.

The majority of the current water distribution system was constructed during the 1890's. In 1936, the summer water demand in the community peaked, which created pressure deficits throughout the system because the water demand exceeded the hydraulic capacity of the piping system. To meet the high summer water demand, a seasonal pump station and storage tank were constructed approximately 1.2 miles downstream of Eagle Lake, near the outlet of the New Mills Meadow Pond. The pump station was designed to supply approximately 5.5 million gallons per day (MGD) to the Town and to a seasonal storage tank on Great Hill. Other than when the pump station operated during the peak summer months, all storage for the water system was supplied by gravity from Eagle Lake.

Today, the water system serves approximately 1,700 residential, commercial and governmental customers. As shown on Figure 1, the water distribution system covers a majority of the Town, extending from the Village of Bar Harbor to the Villages of Hulls Cove and Salisbury Cove to the north. To the south, the water system extends to Jackson Laboratory.

Water usage today is significantly less than it was in 1936, with a peak daily flow of approximately 2.85 MGD during the summer months, and a peak daily flow of approximately 1.6 MGD during the fall, winter and spring months. The average daily flow during the summer months is approximately 1.6 MGD, and approximately 0.9 MGD during the non-summer months. The annual average daily water usage is approximately 1.2 MGD.

During most of the year, the untreated water from Eagle Lake provides the primary storage in the system, although there are three storage tanks in the system. A 500,000 gallon storage tank at Jackson Laboratory provides treated water storage for the southern part of the water system. This tank was constructed primarily to supply the domestic and fire protection water needs of Jackson Laboratory, and is located at the end of a long, dead end pipe run that limits flow back into the Bar Harbor Village area during high demand periods and fire flow conditions. During the peak summer demand period in July and August, water distribution system pressures drop and are insufficient to fill the Jackson Laboratory tank. During this period, the seasonal pump station and 528,000 gallon storage tank on Great Hill near the pump station are used to provide a slight pressure boost in the system and to satisfy the pressure needs at Jackson Laboratory. The only other treated water storage tank in the Bar Harbor water system is a seasonal 50,000 gallon tank that supplies the Salisbury Cove area. This tank supplies a seasonal distribution system that extends to the Mount Desert Island Biological Laboratory in Salisbury Cove.

In summary, the existing system has a treated water storage capacity of 1.078 million gallons (MG) during the summer months, and a year-round storage capacity of 0.5 MG located at Jackson Laboratory.

2.3 TREATED WATER STORAGE REQUIREMENTS

As stated in Section 2.1, the Maine Drinking Water Program has required that the Water Company have the ability to isolate the untreated Eagle Lake water supply from the distribution system in the event of a failure of the disinfection system. This requirement in turn requires that there be sufficient treated water

storage within the system to supply the needs of the community for the duration of a treatment system failure. The standard procedure for determining the proper storage volume required by a water distribution system is to evaluate three storage components: equalization storage, fire protection storage, and emergency storage.

2.3.1 Equalization Storage

Equalization storage is the amount of storage required to ensure that the treatment system can supply the peak demands of the system. Many water systems have a treatment capacity equal to the maximum daily water demand in the system. The equalization storage is used to supply treated water to the distribution system during peak hourly flows. Since the capacity of the Bar Harbor water treatment system is approximately 5.5 MGD (or 3,800 gallons per minute (GPM)) and the highest peak hourly flow recorded since September 1997 is 3.8 MGD, equalization storage is not needed.

2.3.2 Fire Storage

Fire-protection storage requirements are commonly determined using procedures developed by the Insurance Services Office (ISO). ISO has prepared a Fire Suppression Rating Schedule which is used to calculate needed fire flows (NFFs) for buildings in community. The ISO Schedule is also used to develop a Public Protection Classification for fire insurance rating purposes in a community. Ideally, a public water system should be capable of providing the maximum NFF within the distribution system area; however, this is often not feasible. ISO's requirements for a public fire protection system are limited to supplying NFFs of 3,500 GPM or less. Buildings with higher NFFs are often better served by sprinkler systems.

The Bar Harbor water system should have sufficient fire storage to supply an NFF of 3,500 GPM, which is the maximum flow that ISO requires for a public fire protection system. The required duration for supplying this NFF would be 3 hours, which results in a recommended fire protection storage volume of 630,000 gallons. Presently, this needed storage is primarily provided by Eagle Lake during most of the year. Since the treatment system capacity of 3,800 GPM exceeds the recommended maximum fire flow of 3,500 GPM, the continued use of Eagle Lake for fire storage is reasonable.

2.3.3 Emergency Storage

Emergency storage is the amount of storage required to continue supplying water during an emergency, such as a failure of the treatment system, or a break in a water transmission main. Since the Maine Drinking Water Program has mandated that the Water Company have the ability to isolate the untreated Eagle Lake water supply from the distribution system in the event of a failure of the disinfection system, this storage component is now critically needed. The emergency storage volume is commonly equal to the maximum daily demand in the system. As stated above, a peak daily demand of approximately 2.85 MGD occurs during the summer months, and a peak daily flow of approximately 1.6 MGD occurs during the fall, winter and spring months.

2.3.4 Summary of Storage Needs

In summary, equalization storage and fire flow storage are not needed due to the high capacity of the treatment system, but emergency treated water storage must be provided to supply the peak water demand in the system.

Providing 2.85 MGD of storage based on the peak summer flow would be excessive and cost prohibitive, and could create water quality problems during periods of low water demand. To provide a full day's emergency storage for the extreme case, which may only occur over a period of three months, is not warranted in this system. Emergency storage should be provided based on the peak daily flow likely to occur during most of the year, 1.6 MGD. This storage volume of 1.6 MG could supply the maximum daily flow during the non-summer months, and could also supply the average daily demand during the summer months.

3.0 ALTERNATIVES

Several alternatives were evaluated to fulfill the immediate needs for 0.5 MG of additional treated water storage to serve the high-demand area in the Village of Bar Harbor in the Bar Harbor water system.

To effectively serve the high demand area, the proposed 0.5 MG storage tank should be located along the high capacity 20 inch transmission main that feeds the Town, and must be located downstream of the recently installed isolation system at the pump station, which is also the point in the system where sufficient treatment has occurred. Although sites exist within the Park upstream of the pump station that have been disturbed previously, such as an old water filtration plant near Eagle Lake, these sites would not be suitable because the required level of treatment has not occurred until the water reaches the pump station.

To provide fail-safe storage, it is preferred that the tank fill by gravity from Eagle Lake, which has a water surface elevation of 277 feet; therefore, the elevation of the site is critical for proper and efficient operation of the tank. The tank site should also be within 500 feet of the 20 inch transmission main to minimize the length of piping required.

Based on these constraints, the tank should be located somewhere between the pump station and the Bloomfield Road (see Figure 1). The alternative water storage sites evaluated are shown on Figure 2, and are described in detail below. Alternative B is the preferred alternative, one that the Water Company believes will best suit its needs while minimizing environmental impacts. With the exception of Alternative F shown on Figure 2, all of the alternatives meet the location criteria described above.

The additional 0.5 MG of storage will provide a total year-round treated water storage capacity of 1.0 MG (1.578 MG during summer operation), which will solve the immediate need for emergency storage; however, the total storage will still be less than the system should have for the long term. Eventually, the Water Company hopes to upgrade the existing 50,000 gallon seasonal storage tank that supplies the Salisbury Cove area to a larger tank that will improve fire flows and provide emergency storage for the northern part of the distribution system.

3.1 ALTERNATIVE A: NO ACTION

The No-Action alternative does not meet the mandate of the Maine Drinking Water Program to provide additional treated water storage in the Bar Harbor Water System. This alternative is included to describe what will happen if no action is taken and to compare the effects of other alternatives on the natural and human environment.

Under this alternative, if the disinfection system fails, an isolation valve will shut off water transmission. Businesses, residents, and government facilities will be without water. If the disinfection system is not repaired immediately, an order will be issued to users of the water system to boil all water before use (Boil Order). The Bar Harbor Water Company would be subject to fines and other enforcement action, including a mandate to construct a water filtration plant. Building a water filtration plant would cost between $3.5 and $5.25 million dollars; the cost would be borne entirely by Water Company customers. The effects of building a water filtration facility on the natural and human environment have not been analyzed, but could be significant. Even if the Bar Harbor Water Company was forced to construct a water filtration system, additional treated water storage would be needed to bring the system into compliance with State and Federal mandates.

3.2 ALTERNATIVE B: CONSTRUCT A GRAVITY-FED RESERVOIR ON GREAT HILL (PREFERRED ALTERNATIVE)

After obtaining a Right-Of-Way Grant with the National Park Service, a 500,000 gallon, below-grade concrete reservoir and access road would be constructed on Great Hill near the existing summer pump station and storage tank. The proposed location is near the existing transmission main downstream of the isolation valve, and would be at the appropriate elevation to fill by gravity from Eagle Lake. The proposed tank would be 50 feet wide by 140 feet long by 14 feet deep. As shown in Figure 3, the tank and access road would be constructed into the slope of the hill. After removing any soil from the construction site, bedrock would be blasted and removed. The sides and cover of the tank would be constructed of concrete, with a thick, plastic liner placed on top. The completed tank would be backfilled with gravel and material removed from the tank site (primarily blasted bedrock), to create a slope around the tank. The tank and plastic liner would be covered with foam insulation and 12 inches of sand and topsoil. The area above and around the tank would be planted with native herbaceous plants. Native woody plants matching those found in the surrounding forest, such as white pine (*Pinus strobus*) and birches (*Betula populifolia*, *B. papyrifera*), would be planted on the slope below the tank. A fence would be installed around the perimeter of the tank to protect the plastic liner from damage.

An access road to the tank would be built from the Duck Brook Road across from the pump station building 350 feet to the tank. Trees and other vegetation would be removed approximately 25 feet back from the centerline to prepare for the installation of the road. The road would be 14 feet wide and constructed of gravel. Surface drainage for the access road would be carried by ditches. At the lower end of the access road, storm water would be conveyed through an existing culvert that provides drainage for the Duck Brook Road.

Two underground 12 inch diameter pipes, one to supply the tank with treated water and the other to return stored water to the transmission lines, would be buried 5 feet deep in the road bed.

Construction would occur from March to July, then resume in September and October, 2000, if necessary. The estimated cost to construct the tank would be approximately $600,000.

Before the tank is placed in service, a leakage test will be performed to ensure the integrity of the tank. If leakage is ever a problem, sealants will be applied to the interior of the tank to ensure it is watertight. Annually, the tank will be drained, inspected and cleaned if necessary. The design life of the tank should be at least 75 years.

Maintenance of the tank site will include periodic mowing.

3.3 ALTERNATIVES CONSIDERED BUT REJECTED

3.3.1 Alternative C: Construct a Gravity-fed Reservoir on Abandoned Reservoir Site

At the turn of the century, an open, gravity-fed reservoir existed near the intersection of the Duck Brook Road and the Park Loop Road, as shown on Figure 2. Portions of the abandoned reservoir are still in place today. The abandoned reservoir has not been evaluated for historic and cultural significance.

This site was initially investigated because it had been disturbed for a similar use in the past. When the site was surveyed, it was determined that the maximum water level in the abandoned reservoir was

approximately 20 feet lower than Eagle Lake, which is too low to adequately supply the Town's current pressure needs during gravity flow operation. To build a below-grade tank at the appropriate elevation would require the placement of approximately 7,500 cubic yards of fill prior to constructing the tank, at a cost of approximately $185,000. Approximately 4,500 cubic yards of additional backfill would be needed around the completed tank. The tank and filling would require clearing an area approximately 50 percent greater than the area required to construct a tank under Alternative B. Alternatively, an above ground storage tank could be constructed on this site; however, this could have a greater visual effect, which is a major concern under this alternative because the site is visible from the Park Loop Road.

As a result of the evaluation, this alternative was rejected due to the unacceptably high construction cost that could result due to the amount of fill required to construct a below-grade tank, which could increase the construction cost by approximately 30 percent. Additionally, the site is visible from the Park Loop Road, which could create greater visual effects due to the amount of clearing and fill that would be required. Because the construction footprint would be larger, all effects of the project would be greater.

3.3.2 Alternative D: Construct a Standpipe Across from Abandoned Reservoir Site

This alternative involves a site adjacent to the water transmission main across Duck Brook Road from the abandoned reservoir site described above under Alternative C. The site is approximately 80 feet lower than Eagle Lake, and would require the construction of a standpipe (a tall, slender, above ground storage tank), rather than a below ground reservoir. The required tank would be approximately 33 feet in diameter and approximately 80 feet tall. Because such a structure would be highly visible from the Park Loop Road, which would be unacceptable to the NPS, this option was not given further consideration.

3.3.3 Alternative E: Upgrade Existing Great Hill Storage System for Winter Operation

The existing storage tank on Great Hill was designed for seasonal use to meet the peak summer water demand during the 1930's. As discussed above, this tank is currently used during the summer tourist season to maintain sufficient pressure downtown and at Jackson Laboratory. Typically, the tank is filled and placed in service just before Independence Day, and is drained and taken out of service just after Labor Day.

Because the Great Hill tank was designed for seasonal use, it is presently not suited for use during cold weather, and modifications would be necessary to protect the system from freezing during winter operation. The largest concern during winter operation would be the potential for freezing of the water transmission piping between Eagle Lake and the pump station, because when the tank is full and the pumps are off, no flow occurs in the transmission piping. The piping system is located in the woods and follows Duck Brook from Eagle Lake to the pump station. Due to the presence of ledge, the piping system was constructed on the ground surface with little or no earthen cover for frost protection. Freezing is presently prevented during the winter by the continuous flow of water within the piping.

If the Great Hill pump station and storage tank were to be converted to year round service, the system would need to be configured to ensure that flow occurred in the transmission system at all times during the winter to prevent freezing. This would require the installation of an automatic drain system that would discharge treated water from the piping at the pump station when the pumps are off. Because chlorine is injected into the water at Eagle Lake, the discharged water would need to be chemically treated to remove the chlorine from the water before it is discharged in order to protect aquatic life. The chemical (sodium bisulfite) which would need to be added to remove the chlorine can create an additional concern, because if too much of the chemical is added, it will remove oxygen from the water, thereby potentially harming

aquatic species. The Water Company would also need to obtain State and Federal discharge permits for the drain water, and would need to continually monitor the water quality to comply with permit requirements.

Another problem that would need to be addressed to convert the existing system to year round service is the size of the pumping system. The pumps are oversized and provide approximately 3,800 GPM (5.5 MGD), which is more than three times the maximum day demand and more than six times the average day demand during the winter months. Therefore, the pumps would only operate an average of four hours per day during the winter. This could lead to water quality problems in the tank due to insufficient circulation. To resolve this issue, smaller pumps would be needed. Additionally, a standby generator would be needed to ensure that the system would function during power outages. The total construction cost for the necessary modifications would be approximately $200,000; however, the annual power consumption costs due to pumping would be approximately $17,000.

This alternative was rejected due to the lower reliability of the storage system because of the risk of freezing, and the fact that the system can only function if the pumps are operational. The operational and environmental concerns that would be associated with the winter drain system that would be needed to protect the system from freezing were also deemed unacceptable. Also, due to inefficiencies in the system, because pumping the water to a higher elevation provides no benefit during most of the year, and only a slight benefit during the summer, because the added pressure must be dissipated at the pump station in order to prevent excessively high pressures in the downtown area. Therefore, the energy needed to pump the water into the tank is wasted, which could have long term environmental effects.

3.3.4 Alternative F: Use Existing Storage Tank at Jackson Laboratory

As discussed in Section 2, the existing 500,000 gallon storage tank at Jackson Laboratory presently provides treated water storage for the southern extremity of the water system. This tank was constructed primarily to supply the domestic and fire-protection water needs of Jackson Laboratory, and is located at the end of a long, dead-end pipe run that limits flow back into Town during high flow periods and fire flow conditions. Presently, this tank can only supply emergency treated water storage to the Town during low flow periods. Even if the water mains were upgraded so that the Jackson Laboratory tank could provide treated water storage for the downtown area during all demand conditions, the Bar Harbor water system would still lack sufficient treated water storage. For that reason, Alternative F has been eliminated from further consideration.

3.4 SUMMARY OF ALTERNATIVES

Table 1 summarizes the advantages and disadvantages of the six alternatives considered. The alternatives analysis points to Alternative B as the preferred alternative, and the only one that merits a detailed assessment of environmental issues. Alternatives C through F were eliminated from further consideration because none of these alternatives are considered practical and feasible.

TABLE 1: SUMMARY OF CONSIDERED ALTERNATIVES

ALTERNATIVE	ADVANTAGES	DISADVANTAGES
A. No Action		• The untreated water source cannot be isolated from the water distribution system in the event of a failure of the treatment system, as required by the Maine Drinking Water Program. Therefore, it does not meet the goal of the project.
B. Below Grade Gravity Fed Reservoir On Great Hill (Preferred Alternative)	• Site elevation is appropriate to allow gravity feed into tank with minimal site disturbance. • Site location is near the large diameter transmission main which supplies the Bar Harbor Village area. • Lower operating cost than Alternative E because pumping is not required. • Greater reliability than Alternative E because pumping is not required. • Lower maintenance than Alternative E. • Lower visibility than Alternatives C and D. • Lower construction cost than Alternatives C and F.	• Requires a Right-of-Way Grant with NPS. • Higher construction cost than Alternative E.
C. Below Grade Gravity Reservoir On Abandoned Reservoir Site	• Site was previously disturbed for a similar use. • Site location is near the large diameter transmission main which supplies the Bar Harbor Village area.	• Requires a Right-of-Way Grant with NPS. • Site is too low. Requires a significant volume of structural fill to raise the site to the appropriate elevation to construct a below grade reservoir. • Higher construction cost than Alternatives B and E. • Greater visibility than Alternative B. Would be highly visible from the Park Loop Road. • Site could have historic or cultural resources that could be negatively affected.
D. Standpipe Across From Abandoned Reservoir Site	• Site location is near the large diameter transmission main which supplies the Bar Harbor Village area.	• Requires a Right-of-Way Grant with NPS. • Greater visibility than Alternatives B and C. Would be highly visible from the Park Loop Road.
E. Upgrade Existing Great Hill Tank for Winter Operation	• Lower Construction Cost. • Uses existing storage infrastructure.	• Risk of transmission pipes freezing between Eagle Lake and the pump station. • Requires permitting, monitoring and supplemental treatment for automatic drain system during winter operation to prevent freezing of transmission pipes. • Risk of damage to aquatic species due to chemicals in water discharged through automatic drain system. • Higher operating cost due to need for pumping which provides no benefit during most of the year.
F. Use Of Existing Tank At Jackson Laboratory	• Uses existing storage infrastructure.	• Does not meet the goal of providing sufficient treated water storage.

4.0 AFFECTED ENVIRONMENT

This Section presents a description of the existing environment before any action is taken. After a brief description of Acadia National Park, focus is placed on the site characteristics associated with Alternative B, constructing a new water storage tank and access road at Great Hill. Because Alternatives C through F have been eliminated from further consideration for technical, regulatory, or aesthetic reasons, the affected environments associated with these sites have not been evaluated in any detail.

4.1 ACADIA NATIONAL PARK

Acadia National Park (ANP) is located on Mount Desert Island, Maine in Hancock and Knox Counties. The 38,000-acre park consists of glaciated mountain, lake, coastal shoreline, and island landscapes, and includes extensive and nationally significant road and trail systems offering accessible and diverse day-hiking opportunities.

ANP has three main purposes. Broadly stated, these are: 1) to protect and conserve the land and water resources, including scenery, natural and historic objects, wildlife, and wild character of the park; 2) to promote and regulate recreational use of the park; and 3) to promote and preserve the scenic, ecological, historic, archeological, and cultural resources of the Acadian archipelago. These purposes are more formally acknowledged in the Park's mission statement, as follows. "*The National Park Service at Acadia National Park protects and conserves outstanding scenic, natural, and cultural resources for present and future generations. These resources include a glaciated coastal and island landscape, biological diversity, clean air and water, and a rich cultural heritage. Acadia National Park also offers opportunities for high-quality nonconsumptive recreation, education, and scientific research*." The mission statement, based on park legislation and the 1992 *General Management Plan*, was later adopted in the 1997 Strategic Management Plan.

The carriage roads, Park Loop Road, and 130 miles of hiking trails are significant park cultural resources. The 57-mile Carriage Road System, originally designed for horse-drawn vehicles, combines state-of-the-art technology with rustic beauty. The carriage roads are particularly noteworthy in that they provide an interconnected system of easily-accessible, low-angle roads for hiking, bicycling, skiing, horseback riding, and other forms of non-motorized recreation. These roads, which are used by millions of visitors each year, are designed and maintained to provide plentiful unobstructed views of the park's spectacular natural scenery, all the while remaining unobtrusive features mostly hidden from view from other roads and trails in the park. The Carriage Road System is considered America's finest extant example of broken stone roads, and was listed on the National Register of Historic Places on November 14, 1979[1]. The Park Loop Road was also determined to be eligible for listing on the National Register of Historic Places by the Maine State Historic Preservation Commission on March 26, 1993. These roads provide access to trails, scenic vistas, and other day-use recreational facilities.

---

[1] National Park Service List of Classified Structures, 8/1/96.

4.2 PROPOSED GREAT HILL WATER TANK SITE

4.2.1 General Location and Description

The site of the proposed new water tank and access road is located on Mount Desert Island in the northern portion of ANP just west of the Town of Bar Harbor. The site is situated on the lower flanks of Great Hill, just east of the Duck Brook Road (Figure 2). The area where the tank is proposed is approximately 200 to 260 feet east of the road, and at its closest point, about 360 feet from the Bar Harbor Water Company Pump Station. The existing Great Hill water storage tank is approximately 500 feet up hill and to the south. The historic Duck Brook stone bridge, connecting Duck Brook Carriage Road to Duck Brook Road, is located directly opposite and approximately 300 feet from the western edge of the tank. Elevations at the water tank site range from 260 to 280 feet above MSL; the area of the proposed access road ranges from approximately 200 to 280 feet above MSL. The overall grade of the site is approximately 15 percent.

4.2.2 Soils and Geology

The Hancock County Soil Survey[2] identifies the soil at this site as the Lyman-Tunbridge Complex, which is a soil association composed of shallow, well-drained upland soils formed in glacial till. Field observations[3] confirmed that the soils were thin and rocky, with numerous bedrock outcrops and small to medium-sized boulders at the surface (Appendix A Photos 1 and 2). Overall, the soils and geologic conditions are similar to many areas of the ANP, and are typical of the areas burned over by the fire that swept through this portion of the park in 1947.

4.2.3 Wetlands and Water Resources

The proposed water tank site contains no wetland habitats as defined by Federal or State of Maine wetland regulations. There are, however, several shallow drainage patterns that convey runoff from upslope areas (Appendix A, Photo 3). These drainages are not considered streams because of their lack of defined banks, and but do appear to carry water during spring runoff and heavy storm events. Natural drainage is generally directed downslope, across the site toward Duck Brook Road.

To the west of the site, across the Duck Brook Road, are New Mills Meadow Pond and Duck Brook (Figure 2). New Mills Meadow Pond is a series of small ponds or natural impoundments with a large emergent freshwater marsh component. The Pond is actually part of Duck Brook, which reforms at the outlet of the Pond and flows north to Frenchman Bay in a steep-sided valley.

4.2.4 Vegetation and Natural Communities

The site of the proposed water tank is wooded, and dominated by a pole-sized, mixed hardwood forest, typical of many lower valley settings on Mount Desert Island that have developed since the 1947 fire (Appendix A, Photo 4). Tree species comprise about 95 percent of the vegetation on the site, with a predominance of sapling and pole-sized gray birch (*Betula populifolia*), white birch (*B. papyrifera*), red maple (*Acer rubrum*), and red oak (*Quercus rubra*). The dominant and co-dominant trees are primarily

---

[2] U.S. Department of Agriculture, Soil Conservation Service, 1989.

[3] Woodlot Alternatives, Inc., November 1999 site visit.

mature big-tooth aspen (*Populus grandidentata*) scattered over the site. These aspen trees are approximately 52 years old, with an average DBH (diameter at breast height) of 8 inches. They typify the rapid, post-fire regeneration that has occurred in the valley areas of ANP since 1947. Canopy heights on this site range from 28 to 42 feet, with the larger trees found on the lower portions of the slope. The understory is sparse and patchy, showing signs of heavy deer browse. Understory vegetation includes a scattered huckleberry (*Gaylussacia baccata*) and withe-rod (*Viburnum cassinoides*), as well as scattered red spruce (*Picea rubens*), red pine (*Pinus resinosa*) and white pine (*Pinus strobus*) regeneration. Groundcover is primarily leaf litter, with sparse bracken fern (*Pteridium aquilinum*), fine-leaved sheep fescue (*Festuca filiformis*), and sheep laurel (*Kalmia angustifolia*).

4.2.5 Rare Species or Habitats

To determine if any rare plant or animal species were associated with the proposed water tank site, State and Federal natural resource agencies were contacted, and a fall site survey was conducted (Woodlot Alternatives, Inc., November 1999). Copies of the correspondence are contained in Appendix B. The agencies contacted include:

1. Maine Department of Conservation, Natural Areas Program (NAP), Augusta, ME;
2. U.S. Fish and Wildlife Service (USFWS), Concord, MA; and
3. Maine Department of Inland Fisheries and Wildlife (IFW), Machias, ME.

Rare Plants

The Natural Areas Program keeps records of rare or unique botanical features in Maine, including habitats of rare, threatened, or endangered plant species and unique or exemplary natural communities. NAP's response indicated the presence of Nantucket shadbush (*Amelanchier nantucketensis*) on or near the site along Duck Brook. This plant, presently considered threatened by the State of Maine[4], is one that until recently was thought to occur only in the coastal plain dry forests of Nantucket Island and Cape Cod, Massachusetts. It is an early-successional, shade-intolerant species that colonizes open or disturbed sites such as fields, edges, thickets, stream shores, and roadsides. The reasons why this species is not more common in Maine are not well understood at this time (given that suitable habitat appears to be plentiful in Maine), but the Duck Brook record is one of the relatively few known occurrences in Maine and Nova Scotia.

The NAP indicated in their response that, if there were appropriate habitat for Nantucket shadbush on the proposed site, there was a good chance that the plant may occur there. As noted above, the on-site survey in November 1999 found that the site is completely forested, with no suitable openings or disturbed areas to provide the preferred habitat for this plant species. In addition, the rare shadbush was not found anywhere on, or directly adjacent to, the site during the comprehensive vegetation survey.

---

[4] Per the 1999 Official List of Endangered and Threatened Plants in Maine (NAP, September 10, 1999).

Rare Animals

The USFW biologist (Appendix B) indicated that there were no federally-listed species under their jurisdiction that are known to occur in the water tank project area, with the exception of occasional, transient bald eagles (*Haliaeetus leucocephalus*). Results of the on-site survey also indicate that the existing habitat type is not one that would be expected to provide critical habitat for any of the currently listed endangered species.

One species, the four-toed salamander (*Hemidactylium scutatum*), is currently listed as a Species of Special Concern by the IFW, and was documented near the project area. Past (1958) surveys indicated the presence of four-toed salamanders at Salisbury Cove in Bar Harbor. Spring surveys by Park staff in 1994, 1996, and 1997 revealed four-toed salamanders were one of several amphibian species that utilize at least three crossing areas along Duck Brook Road (B. Connery, ANP; pers. com.). This species is the smallest terrestrial vertebrate in Maine, and also one of the most difficult amphibians to find. There is presently little information about the specific natural habitat requirements of four-toeds in this portion of its range. Because of its small size, secretive nature, and specialized habitat, only a limited number of four-toed salamander records (<20) have been documented in Maine. The species is, however, expected to be widespread due to the fact that their preferred habitat is fairly common in Maine and that there are numerous known occurrences both south of Maine and east of the state in Nova Scotia.

Crossing areas utilized by four-toed salamanders along Duck Brook Road are apparently used to access breeding areas in New Mills Meadow Pond. The first crossing area is approximately 50 feet south of the pump station; the second approximately 150 to 200 feet beyond the pump station to the south. The third is approximately one-half mile further south. The single most common habitat feature of four-toeds noted by herpetologists is wet moss, usually sphagnum (*Sphagnum* spp). The adults are terrestrial and generally associated with forests in or adjacent to sphagnum bogs, or forests with sphagnum-dominated depressions. The four-toed typically takes refuge in wet moss, under fallen objects, and in rotting wood. Small cup-like nests are typically found in damp moss on the undersides of hummocks or under overhanging material situated above standing or slow-moving water. The aquatic larvae are found in small ponds and slow moving streams running through bogs and wet mossy areas. The adults typically hibernate in and under rotting wood and leaves as well as in the channels of decaying tree roots.

Rare Habitats

The proposed Great Hill site has no rare habitats, and is not listed as a Maine Critical Area.

4.2.6 Wildlife Resources

As indicated by the on-site survey, the proposed water tank site contains vegetation and habitat conditions that are very common in the park. Wildlife use of the site would appear to be somewhat limited by the age and size of the hardwood-dominated forest trees, the relatively open understory, and the thin, rocky soil cover. Species commonly utilizing this type of habitat in ANP would include whitetail deer (*Odocoileus virginianus*), common small and medium-sized mammals (i.e., mice, voles, squirrels, raccoons, etc.), common songbirds, and other common forest birds (i.e., hawks, grouse, etc.). Signs of deer use, including heavy browsing and numerous pellet groups, were abundant at the site. Requests for information to the regional IFW wildlife biologist regarding wildlife use of the project area resulted in a response indicating there were no Essential or Significant Wildlife Habitats associated with the site.

Recent wildlife observations in New Mills Meadow Pond and within one-quarter mile of the project area have included a nesting marsh hawk (*Circus cyaneus*), as well as seasonal shorebird and wading bird use (B. Connery, ANP; pers. com.). Most of the shorebird and wading bird use is apparently associated with individuals feeding in the wetland as they pass though the habitat.

The IFW fisheries biologist has indicated that nearby Duck Brook contains a moderate population of wild brook trout, making it a significant resource of moderate value in their rating system for fishery resources. IFW recommended that if the project moves forward, the biological integrity of Duck Brook must be maintained in the process.

Cultural, Recreational, and Visual Resources

The presence of cultural, recreational, and visual resources was assessed by querying the National Park Service/Acadia National Park (NPS/ANP) and the Maine Historic Preservation Commission (MHPC, Augusta, ME), and by conducting an on-site analyses.

The NPS/ANP and MHPC indicate that there are no cultural, recreational, or visual resources of note at the actual site of the proposed water tank (see correspondence in Appendix B). However, nearby Duck Brook Bridge and the associated Carriage Road system, including scenic views from the roads and bridges, are considered significant cultural and recreational resources.

The historic Duck Brook Bridge and adjacent carriage roads are heavily used by hikers, bicyclists, and equestrians from spring through fall, and by lesser numbers of cross country skiers and snowshoers during winter. Viewsheds from the bridge and local Carriage Road sections include portions of Great Hill and the general area of the proposed water tank. As a result, the focus of the following visual analysis is on the scenic character of the proposed water tank site as viewed from the bridge and local Carriage Road vistas points. Effects of the proposed project on views under existing and proposed conditions are discussed in Section 5 below.

5.0 ENVIRONMENTAL CONSEQUENCES

This Section presents the positive and negative effects of the Alternatives on the resources identified in Section 4 above. Effects are organized according to resources.

5.1 ALTERNATIVE A: NO ACTION

Under Alternative A there would be no action; that is, no additional storage for treated water would be constructed. Soils and geologic resources on Great Hill would remain undisturbed. Wetlands and streams near the site would be subject to inputs of chlorinated water if the water treatment system failed and water had to be diverted from the transmission line. This might result in short-term effects on aquatic life, particularly macro-invertebrates. There would be no increase in storm water run-off, as the area of impervious surfaces and vegetation would not change. No vegetation would be cleared to construct a tank or access road. No non-native plants would be introduced into the existing forest. Natural changes to the forest community would continue uninterrupted.

There would be no effects on rare plants or animals. It would be expected that four-toed salamanders would continue to use the hillside opposite the pumping station and salamander migrations from upslope to wetlands would not be interrupted by silt fences. There would be no loss of individual salamanders due to blasting and heavy equipment use of the site, although the effects of possible inputs of chlorinated water into wetlands where four-toed salamanders lay their eggs is unknown.

Wildlife resources on Great Hill would remain unaffected. Brook trout in Duck Brook might be affected by a discharge of treated (chlorinated) water; effects are difficult to calculate and would be dependant upon flow conditions in Duck Brook, timing of any discharge, volume of discharge, concentrations of chlorine, time of year and other factors.

There would be no effects on cultural, recreational, or visual resources, including scenic views from nearby carriage roads in Acadia National Park because there would be no cleared openings on Great Hill.

Perhaps the most important effect of this alternative is on the human environment, specifically on residents, businesses, and area visitors dependant on the Bar Harbor Water System for their potable water needs. Without adequate treated water storage, the system will not meet public health regulations. In the event of a water treatment system failure, water service would be interrupted or discontinued for an unknown period of time. If such an event occurred within a 12 month period from August, 1999, it would be considered a violation of State and Federal safety regulations, and the Bar Harbor Water Company would be subject to fines and would be required to build a drinking water filtration plant. Since any land once owned by the Water Company has already been deeded over to the Park, and since the Water Company's existing infrastructure is within the Park, of necessity, this filtration facility would have to be located within the Park.

The no action alternative would likely cause an increase in the amount water system users pay for water service. The cost of a drinking water filtration plant has been estimated between $3.5 and $5.25 million dollars. This cost would be borne entirely by water users.

5.2 ALTERNATIVE B: NEW GRAVITY RESERVOIR ON GREAT HILL (PREFERRED ALTERNATIVE)

5.2.1 Soils and Geology

The soil and geologic resources existing at this site are not considered unusual or significant in any way, and it is expected that construction of a new underground water tank would not have any significant effects (either locally or regionally) on these resources. All disturbed soils and imported fill material would be permanently stabilized with a native grass seed mix once the tank and pipelines have been installed. In addition, ten to fifteen 2-4" diameter white pines and birches will be strategically placed along the lower slope areas to help feather the edge effects of the clearing as viewed from the adjacent Carriage Roads. The access road would be designed, constructed and maintained to minimize the potential for erosion.

Approximately 3,200 cubic yards of soil and bedrock would be excavated to construct the tank, and approximately 2,400 cubic yards of this material would be used to backfill the constructed tank. Surplus soil and bedrock which is not needed on site would be removed from the site. Approximately 300 cubic yards of imported gravel would be used to construct the access road. All disturbed areas would be stabilized with 4 inches of imported topsoil that would be seeded and mulched.

The imported fill material could possibly contain weed seeds. Particular focus should be made to control the spread of aggressive, non-native weed species that have not become naturalized on Mount Desert. Problem species on Mt Desert that are non-native, invasive, and can be recognized (with some training) by lay people include common buckthorn *(Rhamnus cathartica),* alder buckthorn *(Frangula alnus),* Japanese knotweed *(Fallopia japonica),* common and Japanese barberry *(Berberis vulgaris, B. thunbergii)* and Morrow's honeysuckle *(Lonicera morrowii)*. However, because most of these species are either robust and/or woody, it will be difficult to identify them if the area is closely cut. To help minimize the opportunity for these effects to occur, an aggressive application of a native seed mixture will be initially applied to the site immediately after the final regrading of the site. Actual constituents of that native seed mix will be pre-approved by Park staff prior to implementation. Monitoring will then occur at the end of the first growing season to determine if further action is warranted.

5.2.2 Wetlands and Water Resources

The proposed water tank would not directly affect any wetlands or water resources, as none are present at the site. In general, surface drainage would continue to flow towards the Duck Brook Road. Drainage from upslope areas would be directed over and around either side of the new tank and dispersed into adjacent, undisturbed wooded areas. Because the amount of impervious surface will be relatively small after project completion, no significant increases in the volume of runoff are expected. Drainage from the access road would be carried by ditches. At the lower end of the access road, storm water would be conveyed through an existing culvert that provides drainage for the Duck Brook Road; this culvert discharges to New Mills Meadow Pond.

5.2.3 Vegetation and Natural Communities

Construction of the proposed underground water tank and the access road would result in the permanent clearing of 1 acre of existing hardwood-dominated forest, a habitat type that is common in ANP and on Mount Desert Island. All disturbed soils and imported fill material would be permanently stabilized with a

native grass seed mixture that would be approved in advance by park staff. For this reason, it is anticipated that the project would have relatively slight adverse effects on vegetation and natural communities.

5.2.4 Rare Plant and Animal Species

Rare Plants

Nantucket shadbush (*Amelanchier nantucketensis*), a plant species presently considered threatened by the State of Maine, is known to occur near Duck Brook, several hundred feet east of the proposed water tank site. A field survey (Woodlot Alternatives, Inc, November, 1999) found that the water tank site itself does not contain this species nor any habitat that would be suitable for it. Given the location of the project in relation to the existing Nantucket shadbush plants, and the lack of suitable habitat on site, it is anticipated that the proposed water tank would not have any negative effects on the occurrence of this rare plant. In fact, as an early-successional, shade-intolerant species, and due to the proximity of this species near Duck Brook, the created opening may actually provide an opportunity for individual plants to become established along the outer edges of the project area. No other rare plant species or potential habitat would be affected by the proposed water tank project.

Rare Animals

Notwithstanding concerns over four-toed salamanders, it is anticipated that the water tank project would have no affect (positive or negative) on rare animals, as no rare species or their habitats are known to occur on or near the project site.

Potential concerns for the four-toed salamanders surrounding the development of the proposed tank include: 1) direct loss of individuals, 2) direct loss of habitat, and 3) interruption of migration corridors. None of these three concerns, either individually or collectively, appear to pose a significant adverse impact to regional or local populations of this species. This is primarily due to the small physical size of the impact area, the extent of adjacent hardwood-dominated habitat already available in the vicinity of the project area, and the actual location and habitat characteristics of the proposed project area. Each of these is further discussed below.

The project area will alter approximately one acre of hardwood-dominated woodland habitat, including 0.5 acres at the actual tank site, and another 0.5 acres of clearing associated with the proposed access road. The entire project area represents only a small fraction of the larger forest habitat locally available and immediately surrounding the project area. Big-toothed aspen and birch trees dominate the woodlands, with some red oak. Similar habitat types extend southward three-quarters of a mile along Great Hill ridge to the south end of New Mills Meadow Pond, with southern portions of the ridge containing a higher percentage of red oak. All of this area is within the Park boundary and not considered to be under threat of development.

In addition to limited impacts associated with the small relative size of the project area, the physical site characteristics appear generally restrictive in providing optimum four-toed salamander habitat. Soil conditions in the project area are dominated by shallow, mineral soils with little organic content and frequent bedrock outcrops. There is a thin layer of leaf litter available, but larger diameter, coarse woody debris is relatively sparse and scattered (Appendix A). Though little is known about the terrestrial requirements of this species, ground surface conditions at the proposed site appear limited for species that apparently prefer soils with higher levels of organic material. In addition, except for New Mills Meadows Pond, there are no other wetland habitats or wet depressions capable of providing potential breeding habitat

for this species within or immediately adjacent to the project area. Mapped forested wetland pockets located on the eastern slopes of Great Hill are situated approximately 800 feet east of the project area and apparently beyond the general dispersal distance of most amphibians. Limited studies that have been done in New England suggest that a maximum dispersal distances for four-toeds would be less than 650 feet (A. Richmond, UMA; pers. com.).

Finally, the actual project area is situated upslope and closest to riverine sections of Duck Brook, while more extensive and similar forest-type habitat is available and located upslope of the palustrine wetland system associated with New Mills Meadow Pond. The standing or slow-moving water of the pond provides habitat conditions that are more typically associated with four-toed salamander breeding habitat, while faster-moving stream flows and substrates within the riverine habitats are not considered typical breeding habitat of four-toed salamanders. In addition, any direct migratory route from the project area to the riverine portions of Duck Brook would require crossings at the Duck Brook bridge intersection where ground surface conditions are impacted by wider road and parking areas, and where higher levels of vehicle and human foot traffic are found. As a result, direct use of the project area by four-toed salamanders, as well as migratory travel through the project area by this species, would likely be limited. It would likely be found more readily available in wooded habitat directly upslope from the breeding pond habitat associated with New Mills Meadow Pond. The project specifications will require breaks in the silt fence every 75 feet to allow the migration of salamanders.

5.2.5 Wildlife Resources

The only significant wildlife resource identified in the vicinity of the proposed water tank site is Duck Brook itself, which is considered by IFW to be a moderate-value trout stream. Because the proposed water tank site is several hundred feet from the brook, it is anticipated that the project would have no adverse impacts on the trout fishery or the water quality in the brook. To minimize the potential for erosion and sedimentation, temporary and permanent erosion control measures would be put in place when the water tank is constructed. Existing vegetated buffers between Eagle Lake Road and Duck Brook would not be disturbed.

5.2.6 Cultural, Recreational, and Visual Resources

The visual aspects of the proposed water tank site were assessed by photographing the site from vantage points at the Duck Brook Bridge and several nearby carriage road overlooks, the most obvious locations from which potential visual impacts might be viewed. The analysis was done during full leaf-off conditions (November). Four foot diameter, brightly-colored weather balloons were used to mark the corners of the proposed clearing in an attempt to illustrate in the photographs the extent that the clearing would be visible from the vantage points. Five specific vantage points and the balloon locations are shown in Appendix C.

Results of the visual analysis suggest that construction of a new water tank at the site on Great Hill would have some effect on the views from the bridge and carriage trail lookouts. The photographs in Appendix C show views from the five vantage points in the direction of the proposed tank-site clearing. The photographs suggest that the outline of a clearing would be visible in the forest canopy, particularly from vantage points 3, 4, and 5 along the Carriage Road. The canopy clearing would be less visible from the Duck River Bridge (i.e., Vantage Points 1 and 2), and would most likely be less visible from all vantage points during full leaf-on conditions (i.e., late spring through early fall). Due to its narrow width and oblique angle from the road, it is anticipated that the clearing associated with the access road would not be very visible from the bridge or the carriage road.

As the photos suggest, the clearings associated with the tank site and access road would not create a visual blight in the landscape. The visual changes would be most evident during leaf-off periods. The existing views from most of the vantage points in question are not entirely pristine, as they currently include the existing above ground water tank and the obvious horizontal line created by the Duck Brook Road (see photos 1, 3, 4 and 5). It is anticipated that the proposed cleared areas would only slightly increase the extent of man-made features visible from those points, again, with the most pronounced change evident during leaf-off conditions.

5.2.7 Human Environment

The proposed project would have positive and negative effects on the human environment. The positive effects would be experienced by the water system users, and would include an added level of safety to ensure that all water consumed has been treated to kill viruses and microorganisms in the water source. The proposed project would also prevent violations of the Safe Drinking Water Act, thereby preventing a mandate to construct a water filtration plant, which would significantly increase the cost of water in the community.

The negative effects would be realized by the water system users and Acadia National Park visitors. The water system users would be affected by the cost of the proposed project, which is expected to increase water rates in the community by eight percent. Park visitors would experience the visual effects described in Section 5.2.6.

5.2.8 Cumulative Effects

Cumulative Effect is defined under the NEPA process as *the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such action* (40 CFR•˜ 1508.7).

The Bar Harbor Water Company constructed most of the current water distribution system during the 1890s, prior to the establishment of Acadia National Park. Much of the physical plant of the water system has been previously described. In addition to the intake house on the shores of Eagle Lake, the three water tanks, the pumping station, and the transmission lines from Eagle Lake to, and throughout, portions of the Town of Bar Harbor, the system also includes an abandoned water line running along the lower portions of Duck Brook.

Many of these structures lie on lands acquired by the Water Company and later donated to the United States of America to become part of Acadia National Park. On some of these tracts, the Water Company maintains the right to take necessary actions to provide a water supply to Bar Harbor. The Water Company has worked cooperatively with administrators of Acadia National Park to protect park values and reduce impacts to the environment and community while providing clean, safe, water in sufficient quantities to meet public demand. The management of Great Hill, and other areas on which Water Company structures lie, by the NPS has enabled natural successional processes to mitigate many of the impacts associated with the original construction. Changes to vegetation have reduced the scenic and environmental effects of past disturbances, and daily operations have been kept to a minimum to prevent further disturbance. The effect of the system on scenic values has been minimized by painting both tanks near the park with earth tone colors to blend into the surrounding vegetation.

Federal and State regulations mandate adding treated water storage capacity to the water system, and these requirements are unlikely to change. Implementing Alternative B might reduce the cumulative impacts of maintaining the water supply by reducing the likelihood for future construction of a water filtration plant. However, it should be noted that future regulatory requirements are not known and may change over time. Constructing a water filtration plant would likely cause additional environmental and aesthetic impacts as well as increase the cost of water to users of the system, although the full extent of those impacts are currently unknown. The most logical site for a water filtration plant would likely be on lands currently administered as part of Acadia National Park, and possibly would be near the remains of a former filtration structure. The structural remnants of the former water system have not been evaluated to determine if they have cultural significance.

CONSULTATION AND COORDINATION

6.1 PUBLIC INVOLVEMENT

The need for the proposed water storage tank has been communicated to the National Park Service and the public, and has been documented in the local media.

On May 25, 1999, the Water Company and its Engineering Consultant, Woodard & Curran, Inc., met with officials from the National Park Service to discuss the need for the project and review available alternatives.

On November 17, 1999, a public informational meeting was held at the Water Company office to discuss the need for the project, review available alternatives, discuss potential environmental effects, and respond to questions and comments regarding the proposed project.

Prior to the public informational meeting, a press release describing the meeting was prepared and distributed to the Town of Bar Harbor, The Bar Harbor Times, and the Friends of Acadia. A notice announcing the meeting appeared in the Bar Harbor Times on November 4. The notice appeared in a visible location on Page A5 of the paper. On November 11, 1999, an article titled "Reservoir Planned" appeared in The Bar Harbor Times describing the proposed project and the scheduled public informational meeting. On November 25, 1999, an article titled "Reservoir Site Explained by BH Water Company" appeared in The Bar Harbor Times describing the public informational meeting that was held on November 17, 1999. A subsequent correction appeared on December 2, 1999 in The Bar Harbor Times to correct two errors that appeared in the November 25 article. Copies of the press release and press coverage are included in Appendix D – Press Coverage.

6.2 LIST OF PREPARERS AND CONSULTED AGENCIES

This Environmental Assessment was prepared for the Bar Harbor Water Company and the National Park Service by:

Woodard & Curran, Inc., Engineering, Science, and Operations Consultants; and
Woodlot Alternatives, Inc., Environmental Consultants

The following individuals and agencies were consulted during the preparation of this Environmental Assessment:

Ron Brokaw, Fisheries Biologist, Maine Department of Inland Fisheries and Wildlife
Rebecca Cole-Will, Curator, Abbe Museum, Bar Harbor, ME
Bruce Connery, Wildlife Biologist, Acadia National Park
Philip deMaynadier, Wildlife Biologist, Maine Department of Inland Fisheries and Wildlife
Sara Evans, Information Manager, Maine Natural Areas Program
Linda Gregory, Botanist, Acadia National Park
Judy Hazen Connery, Biologist, Acadia National Park
Mark McCollough, T&E Species Biologist, Maine Department of Inland Fisheries & Wildlife
Chris Raithel, Herpetologist, Rhode Island Department of Environmental Management
Alan Richmond, Herpetologist, University of Massachusetts at Amherst
Earl Shettleworth, Jr., SHPO, Maine Historic Preservation Commission
Kim Tripp, Biologist, U.S. Fish and Wildlife Service, Concord, MA

Dana Vaillancourt, Maine Historic Preservation Commission
Jim Vekasi, Chief of Maintenance, Acadia National Park
Dwight Welch, Wildlife Biologist, Maine Department of Inland Fisheries and Wildlife

6.3 LIST OF RECIPIENTS

The Public Notice announcing the release of this Environmental Assessment will be distributed as follows:

Press

The Bar Harbor Times
The Ellsworth American
Bangor Daily News

Federal Agencies

U. S. Army Corps of Engineers
U. S. Department of the Interior, National Park Service, Acadia National Park

State Agencies

Maine Department of Environmental Protection

Local Government and Agencies

Bar Harbor Water Company
Town of Bar Harbor
Mount Desert Biological Laboratory
The Jackson Laboratory
Bar Harbor Chamber of Commerce

Individuals/Businesses

College of the Atlantic

This Environmental Assessment will be distributed as follows:

Press

The Bar Harbor Times

Federal Agencies

U. S. Department of the Interior, National Park Service, Acadia National Park

Local Government and Agencies

Bar Harbor Water Company
Town of Bar Harbor

Libraries

Jesup Memorial Library, Bar Harbor, ME

Non-Governmental Organizations

Friends of Acadia

Supplemental copies of this Environmental Assessment will be available for distribution to the public and other interested agencies through the Bar Harbor Water Company and the National Park Service/Acadia National Park.